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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/741,122	12/19/2000	Ulf Mikael Ronstrom	43605-00023USPX	6406

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ERICSSON INC.
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EXAMINER

BRAGDON, REGINALD GLENWOOD

ART UNIT	PAPER NUMBER
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2188

DATE MAILED: 09/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/741,122

Applicant(s)

RONSTROM, ULF MIKAEL

Examiner

Reginald G. Bragdon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27-52 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 27-52 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11 August 2004 has been entered.

Drawings

2. The drawings are objected to because:

There is no PCSP or RDSP in figure 2 (see page 14, line 7, of the specification).

3. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the

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drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

On page 18, line 4, Applicant sets forth “data storage region PCS-j, RDS-i”, however PCS-j and RDS-i refer to storage sections, not regions. See page 15, lines 1-5, of the specification.

Appropriate correction is required.

Claim Objections

5. Claims 27-52 are objected to because of the following informalities:

As per claim 27, line 5, “arranged in” is confusing and should perhaps be --each including--.

As per claim 27, line 10, “data regions” should be --at least one data region-- since Applicant has set forth --one or more data regions-- in line 6.

As per claim 36, line 5, “arranged in” is confusing and should perhaps be --each including--.

As per claim 41, line 7, “said first” should be --a first--.

As per claim 41, line 8, “said second” should be --a second--.

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As per claim 45, line 8, "arranged in" is confusing and should perhaps be --each including--.

As per claim 50, line 2, "said page" should be --a page--.

As per claim 50, line 3, "said resident" should be --a resident--.

All dependent claims are objected to as having the same deficiencies as the claims they depend from.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 37-39 and 46-48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claims 37 and 46, Applicant sets forth moving data objects within the data storage region to other data storage sections of the same data storage region in accordance with a determined access frequency. However, it is not clear where there is support for this in the specification. While Applicant does discuss moving data between the same relative data regions

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sections of the page cache sections and resident data sections (i.e. left/right in figure 4, ST6), the sections of the page cache and the resident memory are different sections.

All dependent claims are rejected as having the same deficiencies as the claims they depend from.

Claims - 35 USC § 112, Sixth Paragraph

8. It is noted that the Applicant has set forth in claims 36-52, various “means” (e.g. “processing means”, “read/write means”, etc...). In accordance with the guidelines for examining claims with 35 USC § 112, sixth paragraph limitations, if an Applicant does not set forth 1) “means for” and 2) a corresponding function, then the limitation is not considered a limitation in accordance with 35 USC § 112, sixth paragraph. See the Federal Register, Vol. 65, No. 120 (Wednesday June 21, 2000), at page 38514. Therefore, the “means” of claims 36-52 are not considered limitations under 35 USC § 112, sixth paragraph.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 27, 29-36, 41-45, and 50-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant’s admitted prior art in view of Christenson et al. (6,324,620).

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As per claims 27, 36, and 45, Applicant's admitted prior art teaches a database system comprising a disc device D ("primary memory") which stores a plurality of data blocks organized as pages, where each page consists of one or more data objects. The database system also includes a main memory MM ("secondary memory device") connected to a processor PM. See figure 1-1 and page 2 of the specification. Applicant's admitted prior art teaches "read/write means" at step S3 of figure 1-1. Within the main memory is a resident data memory section that includes a plurality of regions which store the pages (see page 7). Applicant's admitted prior art also teaches the storage of "hot", "warm", and "cold" pages, where the determination of whether a page is "hot", "warm" or "cold" is based on access frequency (i.e. "the number of accesses in a unit time interval"). See page 6, lines 4-8.

Applicant's admitted prior art does not teach creating "data storage sections" within the resident data section RDS and/or page cache section PCS to separately stores "hot" and "cold" pages. Christenson et al. teaches that it was known to create "hot" and "cold" partitions ("data storage sections") within a storage device for the storage of "hot" and "cold" data (based on access frequency--"determining for each data object an access frequency..." or "access frequency determining means"). See column 3, lines 9-20, and column 9, lines 26-32. Christenson et al. also teaches the creation of partitions for storing average data (i.e. "warm" data). See column 9, lines 32-37. A "hot" region ("i+1-th data storage section") has a greater access frequency than a cold region ("i-th data storage section") as set forth by Christenson et al. at column 6, lines 50-56. Movement of data between storage regions is taught at column 9, lines 47-52 (claim 27, steps 2(b)(i)-(ii); claim 36, 3(a-b); claim 45, 3(a-b)). It is readily apparent that each "warmth" section contains an upper and lower threshold. Christenson et al. further teaches

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moving data between “warmth” sections based on the access frequency of a datum. See column 10, lines 35-37.

It would have been obvious to one of ordinary skill in the art to have modified Applicant’s admitted prior art such that the resident data section and/or page cache section is partitioned into “hot”, “warm” and “cold” sections, as suggested by Christenson et al., because Christenson et al. teaches that this would relieve the memory bottleneck of a computer system and increase the speed of the system. See column 2, lines 35-37.

As per claims 29-30, 43-44, and 51-52, Christenson et al. teaches thresholds for the partitioning and data movement. See column 6, lines 64-65.

As per claim 31, Applicant’s admitted prior art teaches that access frequency is based on at least read accesses. See 6, lines 12-13.

As per claim 32, the claim is rejected for the reasons set forth above for claim 4, further noting that Applicant’s admitted prior art teaches a hash table HT storing physical references. It would have been obvious to one of ordinary skill in the art to have updated the physical reference to an object in the hash table when the object was moved in order to prevent errors in accessing an object, thereby deteriorating the functioning of the system.

As per claim 33, the hash table is an index structure.

As per claims 34-35, Applicant’s admitted prior art teaches that part of a database page or record may always reside in the resident data section and other parts of the page or record only reside in the page cache memory occasionally and can be easily moved. See page 7. As set forth for claim 32, the hash table must be updated when a part of page is moved in order to prevent errors in accessing an object.

As per claim 41, Applicant's admitted prior art teaches that the primary memory device is a disc device which stores a database, where the blocks on the disc consists of pages comprised of objects of a plurality of bytes. The secondary memory device is a main memory of the processor PM, which includes a page cache section and a resident data section.

As per claims 42 and 50, Applicant's admitted prior art teaches that part of a database page or record may always reside in the resident data section and other parts of the page or record only reside in the page cache memory occasionally.

11. Claims 28, 40, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Christenson et al. (6,324,620) in view of Miyazaki (6,385,697).

As per claim 28, 40, and 49, the combination of Applicant's admitted prior art and Christenson et al. does not teach storing the access frequency with the data in the memory. Miyazaki teaches storing access frequency information with cache lines. See figure 5. It would have been obvious to one of ordinary skill in the art to stored the access frequency with the data in the memory because this would simplify the process of determining whether data should be moved from one "warmth" section to another "warmth" section.

Response to Arguments

12. Applicant's arguments filed 11 August 2004 have been fully considered but they are not persuasive.

It is noted that the paragraph spanning pages 11-12 of the response merely discusses Applicant's interpretation of the Christenson et al. reference. It is noted that the rejection is

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actually a combination of Applicant's admitted prior art and Christenson et al. (and not just Christenson et al. as set forth by Applicant). One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

On page 12 of the response (lines 4-10), Applicant argues that the present invention differs from Christenson et al. in that it is possible to achieve many levels of characterization based on many different access frequencies. However, this capability is not reflected in the claims, and having only two levels of characterization (i.e. HOT and COLD) meets the claim limitations.

On page 12 (lines 11-15), Applicant argues that the present invention does not deal with "portions of data", it is first noted that some of the limitations Applicant refers to are taught by the combination of Applicant's admitted prior art and Christenson et al., which Applicant has not addressed. Second, "data objects", as set forth in the claims, can be considered "portions of data" (namely, portions of a data block, as claimed).

Furthermore, Applicant states that a data region is further subdivided into data storage sections, with each data storage section having at least two levels of hierarchies for a data representation with a single memory facility. However, this is not reflected in the independent claims.

On page 12 (lines 16-22), Applicant discusses achieving a further detailed consideration for data down to the level of specific data objects. However, it is not clear how this "capability" is supported in the claims. Applicant should point out specific claim language in all the

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independent claims supporting this "capability". Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

13. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

All "OFFICIAL" patent application related correspondence transmitted by FAX must be directed to the central FAX number at (703) 872-9306:

"INFORMAL" or "DRAFT" FAX communications may be sent to the Examiner at (703) 746-5693 (after October 14, 2004, the "INFORMAL" or "DRAFT" FAX number will be 571-273-4204), only after approval by the Examiner.

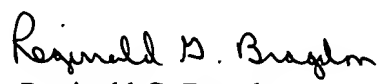
Hand-delivered responses should be brought to Crystal Park II, 2121
Crystal Drive, Arlington, VA., Fourth Floor (receptionist).

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reginald G. Bragdon whose telephone number is (703) 305-3823 (after October 14, 2004, the telephone number will be 571-272-4204). The examiner can normally be reached on Monday-Thursday from 7:00 AM to 4:30 PM and every other Friday from 7:00 AM to 3:30 PM.

The examiner's supervisor, Mano Padmanabhan, can be reached at (703) 306-2903 (after October 14, 2004, the telephone number will be 571-272-4210).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

RGB
September 22, 2004


Reginald G. Bragdon
Primary Patent Examiner
Art Unit 2188